APRIL/MAY 2024

# 23PECH13B — NANOMATERIALS AND NANOTECHNOLOGY

Shanmuga Industries Arts & Science College T.V.Malai

Time : Three hours Maximum : 75 marks

SECTION A — (10 × 2 = 20 marks)

Answer ALL questions.

1. Define nanomaterials given example for bio nanomaterial.

2. Classify quantum dots and nano tubes by their dimensions.

3. Comment on the surface property of nanomaterials and how they are useful?

4. Tell the principle of CVD method.

5. Name any two mechanical properties of nanomaterials.

6. List the applications of chemical synthesis of nanomaterials.

7. Relate the bandgap energy of bulk and nano CdS.

8. Define Hall voltage.

9. Differentiate nanomaterial and nanocomposite.

10. Name some probing techniques in nanotechnology.

SECTION B — (5 × 5 = 25 marks)

Answer ALL questions.

11. (a) Comment on the classification of nanomaterials.

Or

(b) Describe bottom up approach with examples.

12. (a) Demonstrate the bonding in nanomaterials by taking $C_{60}$ as example.

Or

(b) Explain the uses of microwave in nano synthesis.

13. (a) Write about the thermal properties of nanomaterials.

Or

(b) Illustrate the applications of nanometal oxides in photo catalysis.



14. (a) Distinguish the electrical properties of nanomaterials.

Or

(b) Write the applications of nano based photo galvanic cells.

15. (a) Write short note on nano thin films and its characterisation.

Or

(b) Explain the applications of core-shell nano particles.

SECTION C — (3 × 10 = 30 marks)

Answer any THREE questions.

16. Discuss the synthesis, characterisation and likely impact of nanomaterials.

17. Explain various physical methods of nanomaterial synthesis.

18. Evaluate the role of noble metals in nanotechnology.

19. Elaborate the applications of semiconductor nanomaterials with examples.

20. Justify the role of electron microscopy in nano characterisation.

———————